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## Cross Banding: Enabling Communications Interoperability Among First Responders

By Thomas Kidd - April-June 2009

Interoperable communications between federal first responders and non-federal first responders is a vital capability that must be pursued by the Department of the Navy (DON) because Navy and Marine Corps installations have a close, cooperative relationship with adjacent federal, state and local first responders. Ensuring interoperable communications for police, fire, emergency medical services, and other first responder services, is a challenging endeavor that can be achieved and ultimately betters the posture and capabilities of the DON.

Interoperable communications for federal, state and local first responders provide significant benefits in crisis management operations where immediate communications can save lives and prevent the loss of property. But ensuring interoperable communications is a complex process that involves a number of factors, including communications control and coordination of radio frequencies.

Coordination of federal and non-federal radio frequencies used for first responders is not exceedingly difficult; however, there can be challenges emplacing necessary agreements and determining technological configurations that are essential to interoperability.

Preparation is the key to successful interoperability. Interoperability plans and agreements should be preprogrammed, and the spectrum (radio frequencies) required to support these operations should be identified and allocated before an incident requiring interoperability is encountered.

Ad hoc plans and solutions are more likely to result in communication shortfalls than solutions that were pre-planned and ready for implementation.

The first step in attaining interoperability is understanding how spectrum is allocated and may be shared and used within first responder agencies. U.S. spectrum governance was purposefully created to protect federal and non-federal spectrum equities; however, the role of the federal agency first responder in domestic emergencies has increased dramatically over the past few decades.

The U.S. radio frequency spectrum is allocated among federal and non-federal services, and use is governed by similar yet different organizations. The use of federal radio frequencies is governed by the National Telecommunications and Information Administration, while non-federal spectrum use is governed by the Federal Communications Commission.

The NTIA and FCC both recognize and support the use of spectrum for interoperable communications between federal and non-federal first responders.

Federal radio frequency users include the departments of the Army, Navy and Air Force, U.S. Coast Guard, and the departments of Justice and the Interior. Sharing federal radio frequencies between federal first responders requires only agency to agency coordination. Agencies are not required to obtain frequency assignments to share the system provided that there is a federal agency that has obtained a federal radio frequency assignment, and that agency consents to other federal agency use.

Federal agencies can obtain frequency assignments in frequency bands allocated exclusively for non-federal use; however, this action requires NTIA and FCC approval and generally requires significant coordination time to ensure that the NTIA and the FCC can support a given frequency assignment. Information on establishing this type of interoperability can be found in paragraph 8.2.48 of NTIA's Manual of Regulations and Procedures for Federal Radio Frequency Management. Resulting frequency assignments are granted with the provision that no harmful interference will be caused to the service rendered by non-federal stations, present or future.

State, local and tribal governments, as well as commercial and private radio users, are examples of non-federal users. Similar to federal agency use of non-federal frequency assignments, non-federal frequency assignments may be authorized in a frequency band solely allocated for federal use. And, similar to federal organizations obtaining non-federal frequency assignments, the assignments require FCC and NTIA coordination. Resulting assignments are provisioned so that no harmful

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interference will be caused to the service rendered by federal stations, present or future.

Akin to the coordination time for federal frequency assignments in non-federal frequency allocations, non-federal assignments in federal frequency allocations will often require considerable coordination and time.

A common misconception concerning interoperable communications is that all parties must operate on the same frequency. But there are radio systems and equipment that can "cross band" a frequency from one frequency band to a frequency from a different band. Cross banding is transparent to users. Equipment of this type provides many advantages and eliminates the associated challenges of coordinating, acquiring and maintaining "out of band" frequency assignments.

Cross band capabilities allow federal users to operate on frequencies managed by the NTIA, and non-federal users to operate on frequencies managed by the FCC while providing interoperable communications without the use of a single frequency. As such, cross band capabilities minimize the complexity of frequency coordination and use while providing fully interoperable communications.

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